DOCUMENT RESUME

ED 183 498 SP 015 108

AUTHOR Green, Lawrence W.
TITLE Determining the Impact and Effectiveness of Health Education as it Relates to Federal Policy. Health Education Monographs, Vol. 6, Supplement 1, 1978.
SPONS AGENCY Department of Health, Education, and Welfare, Washington, D.C. Office of the Assistant Secretary for Planning and Evaluation.
PUB DATE 78
CONTRACT SA-7974-75
NOTE 40p.: Not available in paper copy due to small print in original document.
AVAILABLE FROM Dr. Lawrence W. Green, Professor and Head, Division of Health Education, Department of Health Services Administration, Johns Hopkins University, School of Hygiene & Public Health, 615 N. Wolfe St., Baltimore, MD 21205.

EDRS PRICE MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS *Federal Programs: Government Role: *Health Education: Health Services: Medical Services: Preventive Medicine: *Program Costs: Program Design: *Program Development: *Research Utilization

ABSTRACT

Research evidence on the potentials of health education for contributing to resolution of national health issues was reviewed. It is concluded that greater investments in health education on selected problems for selected populations would yield a better cost-benefit return than comparable investments in tertiary medical care. High priority groups for specific education changes can be identified, as well as the point of diminishing returns of expenditure, thus focusing and containing health education programs. Among the 36 specific recommendations drawn from the research evidence are a series of criteria for design of health education programs. A general recommendation for a major federal investment in health education research is outlined. (Author/JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED183498

Reprinted with permission by the
U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
from HEALTH EDUCATION MONOGRAPHS, Vol. 6, Supplement 1, 1978

Determining the Impact and Effectiveness of Health Education as it Relates to Federal Policy*

Lawrence W. Green, Dr.P.H.**
Johns Hopkins University
School of Hygiene and Public Health
Baltimore, Maryland

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
Lawrence Green
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

U.S. DEPARTMENT OF HEALTH EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

In response to a set of policy questions posed by the federal government, research evidence on the potentials of health education for contributing to resolution of national health issues was reviewed in detail. A synthesis of the findings concludes that greater investments in health education on selected problems for selected populations would yield a better cost-benefit return than comparable investments in tertiary medical care. In relation to selection and amount, high priority groups for specific education changes can be clearly identified, and the point of diminishing returns of expenditure can be identified; health education programs thus can be both focused and contained. Among the 36 specific recommendations drawn from the research evidence are a series of criteria for design of health education programs. A general recommendation for a major federal investment in health education research is outlined.

This analysis of research evidence on the potentials of health education to help resolve some of the national issues in health policy follows an outline suggested by a series of questions posed by the Department of Health, Education, and Welfare. The purpose of the analysis was not to evaluate individual programs or methods, but rather to assess broad classes of factors which might account for success or failure of health education. Thirty-six recommendations for federal policy are presented and documented in this paper in the order suggested by the questions posed, without concern for their priority. These recommendations are presented conservatively according to the data available to support them.

The major recommendations will be discussed in general terms prior to

---

* *This paper is a revised, abbreviated version of a report prepared for the Office of the Assistant Secretary for Health, Deputy Assistant Secretary for Planning and Evaluation, U.S. Department of Health, Education, and Welfare; Contract No. SA-7974-75; Mona Mitnick, Project Director.*

** *Address requests for reprints to Dr. Green, Professor and Head, Division of Health Education, Department of Health Services Administration, Johns Hopkins University School of Hygiene & Public Health, 615 N. Wolfe St., Baltimore, Maryland 21205.*

Published by Charles B. Slack, Inc., Medical Publisher © 1977.

SP 015108

presentation of individual recommendations to reflect their logical relationship to each other in a federal strategy rather than to the evidence or the questions whence they came; these recommendations are expanded in this overview somewhat beyond the empirical data, on the basis of extrapolation from theory and experience in related fields.

SUMMARY OF MAJOR RECOMMENDATIONS

Health education is found to be highly interwoven with complementary and overlapping technologies of motivational and behavioral control such as mass communications and behavior modification. The federal government is faced with some expensive health problems for which there are obvious solutions or partial solutions if only the public would cooperate with changes in personal health practices. But the government is also constrained by the Constitution, and by ethical concerns, in the degree to which it can press for these changes without representation and informed consent from those citizens whose health-related behavior is in question. It is precisely the process of obtaining health behavior through participation and informed consent that defines the parameters of health education in relation to the overlapping technologies of communication, motivation, and behavior modification, and in conjunction with political and legal processes of legislation and code enforcement. Hence, health education is defined and recommended for governmental deployment as "any combination of learning opportunities designed to facilitate *voluntary* adaptations of behavior which will improve or maintain health."

The operational terms for government action at the program level are "combination" and "designed." How can learning opportunities be designed and combined to facilitate health maintenance most efficiently without coercing behavior? At the policy level, however, the issues are less with methods and design than with selecting those areas of health behavior in which health education can be most effective, and those areas of health in which behavioral adaptations can have the greatest payoff in cost-benefit terms for individuals and for society.

The first part of the paper concerns itself with the question of methods and design of health education; but federal policy must be based primarily on cost-benefit analyses of alternative strategies, which is the subject of the last half of the paper.

In general, the latter section of the analysis concludes that greater investments in health education on selected problems for selected populations would have greater payoff in cost-benefit terms than comparable investments in construction, specialized training, or equipment for tertiary medical care. Indeed health education could help curtail the "upstream" sources of many "downstream" problems if adequately and systematically developed and supported, as has been demonstrated in immunization and family planning programs. Obviously, prevention and tertiary care are not mutually exclusive alternatives, but preventive and self-care improvements have not had sufficient governmental support to achieve even the cost containment

potentials they are capable of offering in relation to medical care.

Given the general conclusion that federal policy should shift some of the resources from future expenditure in medical care to increased current investments in health education, the questions of selection and amount remain critical in times of severely limited spending. Two conclusions are immediately possible from the analysis in relation to the questions of selection and amount:

(1) not everyone benefits equally from a given health behavior, and

(2) spending on health education need not be regarded as a bottomless pit.

Stated more positively and specifically, high risk groups and optimum age ranges can be clearly identified for most preventive and self-care actions which health education can facilitate. Hence, it is possible to target scarce educational resources on those problems and populations where impact and payoff will be greatest, as identified in recommendations 20-35. Furthermore, it is possible to identify the point of diminishing returns in health education expenditures in some types of programs. Additional research is needed on this, but the implication of existing evidence is that health education can be both focused and contained. Unfortunately, most contemporary efforts in health education have been diffuse and continuous, making it difficult to account for their effects or their costs.

A related conclusion drawn from the analysis is that there is a level of health education spending below which health education will have no effect. Like the evidence on the level of diminishing returns, the threshold level is unknown for most programs in health education, leaving expenditure policy to be defined by a large number of technical considerations, as outlined in recommendations 2-15, which must be applied case by case.

One of the most important generalizations that emerges from systematic comparisons of programs and experiments with positive results and those with negative findings (no effect) is that the greater the variety in educational methods used, the more likely the program or experiment will show positive results. This generalization applies both with individuals and with populations. At the individual level, variety in educational methods apparently helps to surround the learner with communications appealing to different senses and modes of learning which are mutually supportive. At the community level, variety in educational methods accommodates the fact that different media have different levels of exposure, attention, credibility, and response for different people in relation to different health problems.

These observations, and related analyses, lead to an emphasis in this report on a series of technical recommendations (#2-8) urging federal priority on programs utilizing multiple health education methods (#2); selected and combined on the basis of prior assessments of health beliefs, attitudes and behavior in the population (#3); with a clear specification of the behavioral outcomes expected for each phase of program development (#4), and evaluated with procedures adapted from standard social research and health services research methods (#6-8). These criteria for the identification of the

most promising proposals for health education research or demonstration may be contrasted with proposals to test a *single* technique or method in isolation; based on *assumptions* about the health attitudes, beliefs and behavior in the population; or selected on the basis of convenience, convention, or professional preference; with vague outcomes to be evaluated with sophisticated but trivial measures. These characteristics of a majority of past programs and studies reviewed account for the largely pessimistic picture of health education portrayed by several state-of-the-art reviewers.

Because so many inadequate programs have been supported with inadequate resources, the cumulative effect on the literature related to health education is unfortunately discouraging. A general recommendation is hereby offered for a federal policy which would offset this effect: that *a five-year program of research and demonstration in health education be directed by the National Center for Health Services Research and/or the Bureau of Health Education in which developmental funds are restricted to a few projects with sufficient magnitude, continuity, and planning to assure the production of results which will answer the following questions in relation to selected health problems:*

—What is the threshold level of health education effort required to achieve initial, minimal changes in health behavior for different high-risk groups?

—What is the point of diminishing returns in health education efforts (e.g., number of home visits, frequency of group meetings, duration of patient counseling sessions) beyond which further investments do not achieve proportionate gains in behavioral change?

—At what point in time following an initial behavioral change is follow-up education most reinforcing in terms of preventing discontinuance of the behavior?

—Which sub-populations (e.g., age groups, socioeconomic groups) respond most favorably in terms of the foregoing criteria to each of the various combinations of educational methods used to achieve these behavioral changes?

If these four fundamental questions can be answered in relation to priority health problems, it will be possible to estimate the minimum and maximum expenditures on health education under National Health Insurance and to establish guidelines on the relative frequency and distribution of educational resources required for different populations.

This paper recommends a number of methods and procedures for obtaining answers to these questions (Recommendations 6-14), and offers an approach to the selection of health behaviors in which both potential effectiveness of health education and potential payoff should be high.

Finally, on the basis of what is known from previous research and experience, recommendations 16-36 identify action policies that can proceed while the research program seeks answers that will eventually improve their cost-effectiveness.

PURPOSE, ORGANIZATION, AND METHOD

The purpose of this study, conducted for the Office of the Deputy Assistant Secretary for Planning and Evaluation/Health (United States Department of Health, Education, and Welfare), was "to develop evaluation criteria to predict the success of various kinds of health education programs." The suggested evaluation criteria are organized here in response to the following specific questions posed by the government:

(1) what kinds of health education programs are most or least effective in achieving specific goals;
(2) for what reasons;
(3) for what health conditions or diagnoses;
(4) under what circumstances;
(5) on what populations and through what providers;
(6) through what kinds of funding mechanisms;
(7) at what costs?

The analysis that follows is based on reviews of the literature, including epidemiologic, demographic, administrative, economic, and behavioral studies of mortality reduction and disease control concepts, programs, activities and methods, with an emphasis on those related to voluntary changes in the health practices of the public. This paper will summarize the findings of these reviews without extensive bibliographic citations. Previously submitted working papers[1-3] and a report submitted in conjunction with Arthur D. Little Company (RFQ 42-75-OS, "Determining the Impact of Health Education Programs on Utilization of Health Services and Other Consumer and Provider Behavior") provide the fuller documentation of conclusions drawn here. Reference will be made more frequently to these and other recent reviews of the literature than to primary sources.

Recommendations for federal policy on health education are based on the findings, on the goals and health policy of the Department of Health, Education, and Welfare (*Forward Plan for Health* for Fiscal Years 1976-1980), and on the uses of research in setting national health policy. The emphasis is therefore on prevention, preparing for National Health Insurance, and quality assurance (the first three priorities), and on cost-effectiveness and cost-benefits of health education (related to the fourth and fifth priorities of the *Forward Plan*).

Priorities for health education in national health policy are analyzed in terms of evidence of effectiveness, potential benefits, target populations, and prospects for support under national health insurance. Recommendations will specify health education activities that need to be directed at maternity patients, preventive child care, preventive adult care, chronic and long-term care, and special settings such as schools and industry. The known efficacy and benefits of health education will be shown to follow this order from firm to tenuous evidence. Other, more tenuous but promising strategies are recommended for further evaluative research.

DEFINITIONS AND SCOPE

The boundaries of programs, activities, and methods that may be characterized as educational are vague. Most health education activities are embedded in other programs and many are not identified as health education. Indeed, those responsible for programs or studies sometimes disavow any association with health education in an attempt to distinguish their efforts as more innovative, modern, technological, behavioristic, client-centered or scientific than they perceive health education to be. Alternative labeling occurs even when the methods employed clearly derive their philosophical, technical and theoretical or scientific approaches from education, educational psychology, educational technology, or health education itself.

The alternative labels used for health education programs and activities reveal the scope and diversity of educational applications in health:

—*Motivation programs.* This term has been used especially in family planning to refer to the activities generally included in health education programs,[4] plus "incentive schemes" designed to appeal more directly to economic motives for family limitation. From a formal psychological standpoint, the term motivation is incorrectly applied when it refers to programmatic activities, because motivation is a construct intended to refer to the internal dynamics of behavior, not the external stimuli. The more correct designation for methods is "motive-arousing appeals."

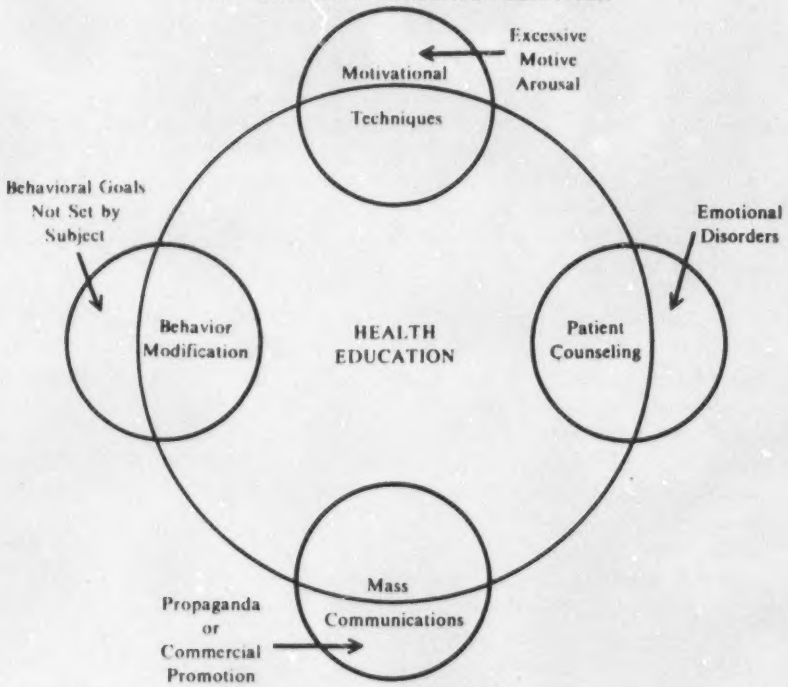
—*Behavior modification.* This term has been extended from its original applications by behaviorist psychologists[5] to include a wider range of educational and political strategies for which the priority objectives are changes in behavior.[6] The original (purist) behavioral psychologists would disallow any educational method that is designed to achieve behavioral changes by means of changing knowledge or attitudes. But behavioral modification (operant conditioning) techniques qualify as educational methods so long as the subjects voluntarily submit to the conditioning procedures to achieve changes they desire in their own behavior.

—*Health counseling.* This term and its variants (genetic counseling, diet counseling, patient counseling) constitute another subset of health education insofar as they represent an approach to voluntary change in health behavior. Most counseling methods of education have their theoretical and philosophical roots in ego psychology, which is at extreme variance with behaviorism. Counseling is outside the scope of health education when it is more psychotherapeutic than informational in its method and content.

—*Communications.* As an interdisciplinary concern of social psychologists, marketing and public opinion research, media specialists, health educators, and others, communications are applied and their effects on behavior are studied in every sphere of human endeavor.[7] Their applications in relation to health behavior are usually within the scope of health education programming,[8-10] except when they are used to advertise or promote products or causes inconsistent with the health needs of consumers.[11]

The foregoing examples of alternative labels used for health education

FIGURE 1
EXAMPLES OF OVERLAPPING TECHNOLOGIES FOR CHANGING HEALTH-RELATED BEHAVIOR



activities illustrate the kinds of commonalities and distinctions that need to be observed in assessing programs. Figure 1 provides an incomplete representation of these separate technologies in relation to health education, suggesting aspects or applications of each which do not qualify as educational. The defining characteristic of health education, as the term will be used here, is the voluntary participation of the consumer in determining his or her own health practices. This is not merely a philosophical tenet. *The overwhelming weight of evidence is that the durability of cognitive and behavioral changes are proportional to the degree of active rather than passive participation of the learner.* There are also practical and legal reasons for the federal government to adhere to this usage of health education to avoid public resistance or reaction to programs which might be perceived as propagandistic, manipulative, coercive, politically or commercially directed, threatening, or paternalistic.

Other forms and methods of health education which define its scope are community organization, in-service training, consultation, group work, computer-assisted instruction (CAI), other teaching machines and audiovisual methods, bibliotherapy, patient teaching, health fairs, exhibits, libraries, and conferences, and routine health provider-consumer interactions.

The scope of health education is defined as much by its expected outcomes as by its methods and forms. Section I outlines the process of health education in terms of the approximate relationships among the outcomes of interest for this analysis.[12]

This review of the scope and definition of health education suggests two recommendations for federal policy:

Recommendation 1. The Department of Health, Education, and Welfare should *retain the general use of the term "health education"* in preference over the narrower and in some instances more insidious alternatives currently used by specialized groups. The alternative terms should be used to refer to specific techniques or strategies of behavior change, but should be associated with health education only where it is clear that the patient or consumer is in control of the decision to change.

Recommendation 2. The Department of Health, Education, and Welfare should *encourage and support health education programs that coordinate two or more of the specific methods of health education in preference over programs employing only one technique or method.*

Because of the complexity of most health practices, no single educational input can generally achieve lasting changes in health behavior without supportive educational inputs directed at other factors influencing the behavior.

Behavioral scientists have made and continue to make significant contributions to the scientific base of health education through basic research on the processes of learning and behavioral change. The applied research of most behavioral scientists, however, tends to isolate single variables influencing behavior rather than multiple variables represented in health programs. This tendency of behavioral research to focus on unitary stimuli is understandable in terms of the goals of the behavioral scientist and the demands of experimental control. It is difficult, however, to apply the findings from tightly controlled, univariate behavioral studies to program planning in health education. As laboratory studies in psychology and survey research in sociology accumulate an increasingly lengthy inventory of determinants and correlates of health behavior, the practitioner and planner is further bewildered in deciding upon which factors to intervene. The foregoing recommendation is intended to encourage a shift in research resources from highly controlled studies of singular methods of health education to field studies or clinical trials of health education strategies combining several methods directed at multiple factors.

Randomized factorial experiments provide the ideal design for implementation of this recommendation. Where such randomization is not possible, quasi-experimental evaluations or demonstrations should be supported (see Recommendation 6) in which most recipients receive a comprehensive educational program and comparison groups receive everything but selected experimental methods.

I. WHAT KINDS OF HEALTH EDUCATION PROGRAMS ARE MOST OR LEAST EFFECTIVE IN ACHIEVING SPECIFIC GOALS?

This question required an assessment not only of the different kinds of programs partially identified in the foregoing discussion, but also of the variegated goals of health education. Several dimensions and criteria on which the goals and outcomes of health education can be measured are:

(a) *Immediate vs. intermediate vs. ultimate goals.* The immediate outcomes of health education programs should be changes (improvements) in selected predisposing, enabling, and reinforcing factors[12,13] which are known or expected to be causally related to the health behavior in question. The general components of health education programs that are found to be most effective with each of the three sets of immediate goals are identified as follows:

- *Communication methods* directed at the consumers and the general public are most effective in achieving changes in *predisposing factors* such as knowledge, attitudes, beliefs, and norms.[7-14]
- *Community organization* and organizational development methods directed at agencies and institutions are generally most effective in achieving changes in the *enabling factors* which facilitate or inhibit health practices, such as availability and accessibility of services, referral mechanisms, third party payment mechanisms, clinic hours, etc.[9-12,15-19]
- *Staff development* methods directed at the health providers and other people who interact with the consumers are most effective in achieving changes in the *reinforcing factors* such as the attitudes and actions of clinic personnel toward walk-in patients, the rewards and punishments that parents and teachers provide children in response to health actions, or that employers provide employees in response to safety practices.[9-12,20-26]

Recommendation 3. In order to influence health practices, health education must effectively change the factors supporting the old behavior or blocking the new behavior; therefore, the Department of Health, Education, and Welfare should *support and encourage programs which include a systematic assessment of these factors prior to the selection of educational methods, in preference over programs which select educational methods on conventional or convenience bases.*

Intermediate goals of health education programs are the behavioral outcomes expected to occur if the immediate goals are achieved. If, for example, a program successfully increases public awareness of a health problem (predisposing factor) and improves the accessibility of services or resources to take action (enabling factors), and increases support for the behavior from parents or employers (reinforcing factors), it will be more likely to achieve changes in behavior than if only one or two of these immediate goals are achieved. Different emphases of programs are known to have

varying effectiveness in achieving five different dimensions of behavior change as follows:

- *Frequency*. If a health action must recur periodically and the goal of the program is to establish a pattern of regularity, then health education methods which provide cues at appropriate intervals tend to be more effective than one-shot or sporadic methods. Well-child visits, dental checkups, annual pap smears, and prenatal visits all have been shown to improve in frequency with a telephone or mailing system that reminds consumers, parents, or patients of their next appointment.[1,27-30]
- *Persistence*. If the required health behavior is one that must be continued over a long period, as with medical regimens for hypertension or diabetes, then health education methods which provide social supports in the clinic and home environments are most effective. Several studies on compliance with medical regimens confirm the importance of the doctor-patient relationship and the patient's perception of support from family members, especially the spouse.[31,32] Persistence with diet and smoking cessation regimens show similar social influences and effectiveness of normative health education strategies.[10,11,33]
- *Earliness*. The behavioral goal in many health education programs is primarily to reduce delay in seeking medical treatment for selected symptoms or to reduce delay in adopting a preventive practice such as immunizations, prenatal care or contraception. The former appears to be heavily influenced by family support and relationship with a health care provider and is therefore most effectively achieved through health education directed at reinforcing factors in the home and clinic environments, as in the preceding dimension of behavior.[34,35] There are site- and symptom-specific variations in this rule, however.[36] Preventive health actions, on the other hand, appear to be responsive in terms of reduced delay to less intensive health education programs. Mass media campaigns, for example, have demonstrated their effectiveness in recruiting new patients to family planning, immunization, venereal disease and various screening programs, but the patterns of clinic attendance in subsequent months and the characteristics of the patients recruited indicate that the media are triggering earlier action in those who were already motivated and who would have come to the clinics at later dates.[37,38] Thus, the mass media are useful in health education when the specific goals are to reduce delay in preventive health actions, but less effective when the goal is to reduce delay with illness or sick-role behavior.
- *Quality*. When the behavioral goal of a health education program is to improve the appropriateness of health actions, i.e., when the consumer must choose between alternative products, sources of care or types of symptom response, the evidence suggests that prior experience with the product or source of care is most influential in determining the quality of the choice. Health education directed at reinforcing factors in the health

care system is most likely to influence appropriate utilization of health services.[10,39,40] Starting with failure to acknowledge and meet patient expectations on the first visit,[41,42] through failure to take family and work situation into account in prescribing therapeutic regimens,[43,44] several points in the health care system are identified where health education can strengthen the probability of appropriate health actions on subsequent occasions. Community organization methods are an essential component of health education when the quality of consumer choices is a function of the availability or accessibility of quality health products or services.[45] Similarly, communications with the public through food labeling,[46] counter-advertising of harmful substances, and public service announcements can increase awareness, arouse interest, and at least direct the choices of those already motivated to take action.

Range. When the behavioral goals of the health education program are highly complex because each individual is expected to adopt a range of different health practices, more intensive health education methods are required. Individualized counseling, home visits, and reinforcement of graduated steps in the behavioral repertoire may be required. Rehabilitation counseling, diet therapy and education of parents of disabled children are most effective when they include these several elements. Health practices which are routine for middle class housewives may be highly complex for rural poor homemakers and generally require more intensive and more long-term educational interventions for the latter.[47,48]

Another classification of behavioral goals sometimes lists utilization, preventive actions, consumption patterns, and compliance as different types of health behavior. As shown in the preceding paragraphs, these types of health practices vary according to the dimensions of behavior, so that there is less similarity between different types of compliance with a specific regimen and consumption of specific products where both the compliance and the consumption patterns are similar on dimensions of earliness, frequency, quality, range or persistence required.[10-12,35,36,48-50] The division of behavioral patterns into health behavior, illness behavior, and sick-role behavior is a theoretical convenience for medical sociologists[51,52] to which health education has had to add the "at-risk role."[53] But these distinctions have not proved as useful in guiding health education programs as has the assessment of behavioral goals in terms of earliness, frequency, quality, range, and persistence. This suggests a recommendation for federal policy in relation to health education programming and research.

Recommendation 4. In assessing the behavioral goals of health education programs, the Department of Health, Education, and Welfare *should seek specificity in terms of behavioral dimensions such as frequency, range, earliness, quality, and persistence* in preference over the broader theoretical classifications of health, illness and sick-role behavior.

The ultimate goals of health education programs consist of reductions in

mortality, morbidity, fertility, and disability. These are usually measured as outcomes in community programs on an aggregate rather than individual scale, using vital statistics of incidence, prevalence, and distribution. When epidemiological measures are not accessible, or when the program is on a smaller scale, medical records, clinic or household interviews, and measures of symptoms or risk factors such as weight, blood pressure, blood or urine tests may be used to assess achievement of long-range goals beyond behavioral changes.

Evaluations of health education in terms of these longer-range goals have been rare for the following reasons:

- —Most health education programs have been too limited in time or resources to seek measures of these longer-range outcomes.[54]
- —Community health education programs, by the nature of their employment of mass media and community organization methods, preclude the availability of control groups unexposed to the program.[55]
- —Some of the most extensive health education campaigns have promoted health practices later found by epidemiologists to be unhealthful, such as the nutrition education programs of the 1940s and 1950s urging people to eat eggs, red meats, and shellfish.[10]
- —Health education programs are usually embedded in a larger program effort so that it is often impossible to unravel the effects attributable to health education from those attributable to other program components.[1]

To overcome these problems, investigators are sometimes tempted to go to methodological extremes which make their results entirely ungeneralizable. It is a mistake, for example, to attempt to isolate the health education component of a total health program and to test that component itself either in the community or in a classroom or psychological laboratory. The consistent failure of such programs to achieve the changes sought attests to the necessity of supporting health education with administrative and institutional arrangements conducive to the behavioral changes sought, and the importance of coordinating health education activities with other program components. These observations compel a further set of policy recommendations.

Recommendation 5. Health education programs or activities should not be supported in isolation from the agencies or institutions to which their consumers must relate. Programs intended to increase utilization of specific health services, for example, should ordinarily be conducted in cooperation with those services rather than apart from them.

Recommendation 6. The Department of Health, Education, and Welfare should *encourage and support evaluations of health education in which the experimental groups receive health education within the context of a total program and the control groups receive everything except health education,* in preference over evaluation in which experimental groups receive only health education and the control groups nothing.

The latter recommendation is fundamental to the external validity or generalizability of findings from evaluative research on health education. The findings from highly controlled but isolated educational interventions are usually negative because health education alone is usually insufficient. They are of limited applicability even when they are positive because the isolation of health education experiences is unnatural as are some of the other conditions of experimental control. The best way to avoid these anomalies of evaluative research is to design the evaluation of health education within the context of an on-going, multi-method health educational program as suggested in Recommendations 2 and 6.

Recommendation 7. The Department of Health, Education, and Welfare should *use behavioral changes as the primary criteria of health education impact,* in preference over criteria of changes in knowledge and attitudes and in preference over the more demanding but less realistic criteria of changes in morbidity, mortality, fertility, or disability rates.

Achieving changes in knowledge, attitudes, and other predisposing factors remains an important step in diffusion and behavioral change processes, but there is little need for additional evidence on the effectiveness of different health education methods in achieving these changes. Increasingly, the important problems for health education are in achieving behavioral changes in populations where high levels of knowledge and often positive attitudes already exist.[10,31-38,56]

Achieving changes in mortality, morbidity, fertility, and disability, on the other hand, while more important ultimately than changes in behavior, is often dependent on non-behavioral factors beyond the direct influence of health education programs. *The judgment of the effectiveness of health education should not have to depend entirely on criteria, measures of which may not be available for many years and may be overwhelmingly influenced by other circumstances over which health education could have no control.* Moreover, the epidemiological, pharmacological, and medical evidence linking the behavior to the vital outcomes is sometimes tenuous, as noted earlier in relation to the nutrition education on eggs and red meats in the 1940s. Today, there is considerable debate in the biomedical and health care literature on the efficacy of some of the procedures and practices on which new intensive health education programs are already underway. Health education can only be held responsible for the behavioral changes, not for the failure to achieve changes in vital rates if the behaviors are successfully changed.

(b) *Time Frame for Goals.* The foregoing classification of health education goals into immediate (improvements in predisposing, enabling, and reinforcing factors), intermediate (behavioral changes), and ultimate outcomes (reductions in morbidity, etc.) is concerned with causal priorities. The first must be achieved before the second can be achieved because the first causes the second, and so on from second to third. There is another time dimension on which health education goals may be framed and the

effectiveness of programs judged. This temporal dimension concerns how soon the goal is to be achieved. Some health education goals can be achieved quickly, even reductions in morbidity; while others, including some changes in predisposing factors, require months, years, or decades to materialize.

Health education programs vary in their capacity to achieve different rates of change, but these variations cannot be analyzed without considering two other dimensions of goal statements: *extensity* (how many people are expected to change), and *target populations* (which groups or individuals in the population are expected to change).

Thus, goal statements in health education, when formally stated as program objectives, contain four elements:

(1) *Who* is to undergo or achieve (2) *how much* of (3) *what kind* of change (4) by *when*?

For example, a health education program goal might be stated as follows: By 1980, the national percentage of former smokers among men in the 21-24 year age group will increase from 20% to 40%.

The time over which the change is expected to occur is very largely a function of (1) the level at which the program begins (the baseline level) and (2) the amount of change expected. The first consideration can be analyzed independently, as a function of timing; the second is a more complex issue to be analyzed in connection with population, cost, and other considerations in later sections.

The relative *rates* of change to be expected from community health education programs can be stated simply: early in the introduction of a new idea or a new program the rate of change (goal achievement) will be slow; as the program progresses the rate of change in the population will speed up until it has included the majority of potential consumers; then the rate of change will become slower as the program attempts to reach the more socially isolated, poorer, and more resistant subgroups. This pattern of rate change in program achievement has been observed consistently across a wide range of program goals where the unit of change was percentage of the population adopting a new practice or innovation.[7,8,10,12,57-61]

The baseline level of prior adoption of the health practice in a community at the time a program is introduced determines the rate of goal achievement to be expected. If the health education program is introduced before anyone in the community has had an opportunity to adopt the practice recommended (zero baseline), it will tend to start slowly. Most programs, however, start in populations where at least some of the people have already adopted the recommended practice and many others are predisposed to adopt but need some information or cue to act. In these circumstances, there will tend to be a temporary leap in the rate of adoption or change. This is sometimes referred to as "skimming the cream off the top" of the community, where "the cream" is analogous to the highly motivated who have risen to the top and are awaiting the program.

Programs that attempt to change attitudes and behavior in the "hard-to-

reach" groups, where the baseline level of acceptance for the larger community is high but recalcitrants remain, will have slow rates of change. Efforts will have to be more intensive and the educational cost per new acceptor will be high, but the benefits per new acceptor will also be high because these tend to be high-risk groups.

Recommendation 8. The Department should use criteria in assessing the relative impact of a given type of health education program which *gives greater weight to changes when baseline levels are higher than to equal changes from lower baseline levels,* in preference over criteria which give equal weight to every percentile point of change.

One index of relative impact that can be applied to data from different health education programs to make the comparisons conform to the criterion in Recommendation 8 is the Effectiveness Index (EI):

$$EI = \frac{P_2 - P_1}{100 - P_1} \times 100$$

Where P_1 is the percentage of the population who have previously adopted the recommended health practice at the baseline, P_2 is the corresponding percentage at a later date (after at least part of the program). The denominator of this criterion represents potential change and the numerator actual change.[12] This measure will tend to favor programs reaching the poor.

2. FOR WHAT REASONS?

The explanations for the variable levels of achievement and rates of change for health education programs can be classified according to the following sources of variation in addition to baseline levels and amounts of change expected: (1) the nature of the behavioral changes sought and the symptoms or diagnoses to which they relate, and the circumstances surrounding the behavior or the health problem; (2) the characteristics of the population exposed to the program, and the source (provider) of the educational communication; and (3) the level of spending on the educational components of the program.

3. FOR WHAT PROBLEMS?

Three facts divert analysis of health education away from health problems. (1) The prevention or reduction of many health problems (e.g., heart disease) requires more than one health behavior. (2) Many health practices (e.g., diet) relate to several health problems, conditions, diagnoses, and symptoms. (3) Many health practices are motivated by beliefs, values, fears, and aspirations unrelated to the specific health problems affected by the behavior.

Given these considerations, it has often been more productive to assess health practices and develop preventive communications in terms of specific populations and their *perceptions* of the health practices rather than the health problems themselves. The analysis will focus here on behavioral problems and will return to specific health problems in the final sections.

Recommendation 9. The Department should attempt *to support health education innovations which do not fit conveniently under categorical funding programs* by channeling some of the categorical funds into health education programs directed at changing practices, beliefs, and attitudes associated with several health problems.

It is sometimes difficult to find demonstration and evaluation funding for school health education, health exhibits, mass media programs, health education resource centers, and generalized patient education and community organization programs because these do not relate exclusively to the concerns of one of the Institutes, Bureaus, or Divisions. The Bureau of Health Education has functioned effectively as a conduit for the mixing of some categorical funds in this way, but lacks sufficient staff to manage many more contracts than it now manages. The National Center for Health Services Research has recently given encouragement to behavioral research having more general health education applications. The recently established National Center for Health Education holds some promise of developing and coordinating federal and private resources for non-categorical health education.

Among the perceived attributes of practices that may influence the rate and extent of adoption of a new health behavior or an innovation are its relative *advantage* over the practice it supercedes; its *compatibility* with the existing values, past experiences, and needs of the receivers; its *complexity;* its *trialability* in terms of being divisible into less complex parts, and its *observability* to other people who may reinforce or disapprove of the behavior.[7]

National surveys on smoking between 1964 and 1970 indicate that the diffusion of smoking cessation has been responsive to these variables, as shown by attitudes and practices in three surveys.[62] Schwartz and Dubitzsky[63] compared the expressed willingness of smokers to try ten different smoking cessation methods. They found that smokers were not willing to use methods most frequently offered by physicians, psychologists, and public health workers. The preferred methods were the more individualized (low observability) methods.

It is bewildering to note in contrast the apparent popularity of group methods for weight control[64] and for exercise programs.[65] Thus, there is evidently an interaction effect between the characteristics of the innovation and the social circumstances surrounding its introduction or promotion.

The acceptability of different health practices is reflected partially in the relative levels of recall knowledge in the public of specific heart-risk factors. The Harris survey[66] of U.S. adults revealed major differences in the salience of specific risk reduction possibilities available to them. A recent community survey in Calgary, Alberta serves as a rough comparison. Mackie found that 53% of her Canadian sample could mention overweight and 42% mentioned smoking as a risk factor, but only 12% mentioned cholesterol. Insufficient exercise was mentioned by 25% of the Canadian respondents.[67] The Harris

FIGURE 2

RELATIVE ACCEPTABILITY OF VARIOUS PREVENTIVE ACTIONS
PUBLIC PERCEPTIONS OF ATTRIBUTES OF THE HEALTH BEHAVIOR
(+ = positive, 0 = neutral or ambivalent, - = negative)

Health Behavior Innovation	Relevance	Social Approval	Advantage	Complexity	Compatibility with Values, Experiences, and Needs	Divisibility or Trialability	Observability
1. Smoking cessation	+	+	+	-	-	+	+
2. Weight control	+	+	+	-	-	+	+
3. Blood pressure control	+	0	-	-	-	+	-
Medication	+	0	-	-	-	+	-
Low Sodium Diet	+	-	-	-	-	+	-
4. Low Cholesterol diet	+	0	+	-	-	+	-
5. Exercise	+	+	-	-	+	+	+
6. Preventive medical examinations	+	0	-	+	+	-	+
7. Immunizations	+	+	+	+	+	+	0
8. Prenatal care	+	+	0	+	+	+	+
9. Breast self-examination	+	0	-	-	-	+	-
10. Well-child care	0	+	-	0	+	+	+
11. Seat belt use	-	0	-	0	-	+	0
12. Teeth care	+	+	+	+	+	+	0
13. Defensive driver training	0	-	0	-	-	+	0
14. Family planning	+	+	+	-	0	+	-

survey asked Americans what they thought were the best ways to prevent heart trouble and got almost a reverse order of risk-factor salience; 44% mentioned proper diet, 34% exercise, 17% smoking, and 16% mentioned weight. The U.S.-Canadian differences could be a function of dissemination of information or possibly only differences in coding the two surveys.

Figure 2 scores various health practices plus, minus, or neutral on each of the seven attributes according to their presumed perception in the general population. The attribute which would seem to be most consistently troublesome is complexity. Most of the risk reduction practices that we recommend to the public are not very simple to understand or to implement. If one were to predict from this heuristic chart the health practice least likely to be followed, assuming that all of the perceived attributes are equally weighted, one might predict poorest results with blood pressure control, especially the diet aspects.[10] National data indicate that approximately 50% of those diagnosed with high blood pressure are under treatment, and only 50% of those under treatment for hypertension are under adequate blood pressure control.[66]

The medical and health education literature on compliance with medical regimens can be regarded as documentation of one aspect of *discontinuance* of adopted health practices.[68-70] Other aspects of discontinuance, including clinic dropouts and broken appointments,[28-30,71-73] and rejection after adoption of intra-uterine devices and oral contraceptives[74] are even better documented with life-table techniques. The following analysis will concentrate on the less organized literature related to discontinuance of exercise and diet for illustrative purposes. Smoking cessation dropouts tend to follow similar patterns.

Discontinuance of exercise programs appears to vary widely depending primarily on the rigor of the program. This supports the generalization that the more difficult exercise innovations would have a slower rate of adoption as well as a higher rate of discontinuance. Thus, Mann had a 41% dropout rate over 6 months in a very demanding program of exercise frequency (4 or 5 sessions per week) and intensity,[75] whereas Oja et al lost only 9% over 18 months with 3 sessions per week and with intensity of exercise individually prescribed at 60 to 70% of the subjects' maximal capacity.[65] Between these two extremes are reports of shorter programs with dropout rates roughly corresponding to effort and duration: 14% in an 8- to 10-week program consisting primarily of running at or near maximum capacity of subjects;[76] 27% in a 12-week program of jogging.[77]

Recommendation 10. The Department of Health, Education, and Welfare should *support applied research on the development and evaluation of preventive measures which simplify the requirements for consumer effort, time, technical knowledge, and are adaptable to individual variations in commitment.*

Data on the characteristics of participants in community programs for weight reduction and their discontinuance of dieting practices are limited.[78]

Within the past 15 years, traditional clinical approaches to weight reduction have been replaced with more encouraging results by behavior modification procedures,[79,80] self-help groups,[64,78,81-84] and combinations of the two. These more effective modern approaches still require continued study of the persisting problem of discontinuance.

The self-help group approaches represented by TOPS (Take Off Pounds Sensibly) and Weight Watchers have apparently minimized the dropout problem by providing graduated social rewards over time. Yet, the clubs continue to have "a large but undetermined turnover in membership."[64] The average duration of membership in 22 chapters of TOPS studied by Stunkard in West Philadelphia was 16.5 months, with an average weight loss of 15 pounds. Levitz and Stunkard compared these results very favorably with group efforts under medical auspices.[85] There are few evaluations of health education or self-help programs that trace participants for more than a few months after exposure to the program, partly because of the fiscal realities of grants and contracts.

The premature termination percentages for participants in behavior modification experiments for control of obesity have ranged from 0 to 83, with higher dropout rates for female college students than for other groups.[80] The longest program was that of Jeffrey et al, which lasted 18 weeks and lost an average of one percent of its adopters per week.[86] In general, the discontinuance rates are impressively low, but long-term follow-up of 6 months or more has not been included in enough studies to determine the extent of discontinuance of self-management innovations after the experimental phase of weight control, or of exercise and smoking cessation programs.

Recommendation 11. The Department of Health, Education, and Welfare should *seek ways of funding longer term follow-up evaluations of health education without necessarily providing continuous support between program and follow-up.* But duration of program funding should not be unduly shortened just to make evaluation possible.

Ways of implementing Recommendation 11 might include grants or contracts with two separate payments, one during the year of the program and one during the year of the follow-up; funding separate investigators to conduct the program and the follow-up evaluation; soliciting proposals for follow-up of experimental and control groups from major programs conducted in the past. The caution to be sounded is that program design, quality, or duration should not suffer for the sake of evaluation, or there will be nothing worth evaluating.

4. ON WHAT POPULATIONS AND THROUGH WHAT KINDS OF PROVIDERS?

Generalizations concerning the receivers and providers of health education come largely from the literature on diffusion and communication effects. Combined with social structural effects, the variables in this class probably

account for most of the remaining variance in health behavior. Many of the communication variables cannot be separated from the structural effects to which they are related.

Paraprofessional and Indigenous Workers

The earlier research on the relative effectiveness of different health communication sources has given way to process interpretations related to the social distance and identification between patient and communicator.[7,11,19,47,48,57,59,87-90] This perspective, combined with cost-control considerations,[1] has supported the trend in developing new categories of indigenous health workers, health education aides, etc. to improve communications with poor patients and ethnic and socioeconomic groups that differ from those of most professionals.[29,91-93] Grosser, for example, evaluated the effectiveness of "local residents" employed in a neighborhood health center as mediators between professionals and low-income patients. He found that they were more effective than professionals in interpreting and predicting the attitudes and behavior of the patients, but not significantly more effective in changing their attitudes and behavior. His interpretation was that local residents begin to identify more with the professionals than with the population from which they were drawn, thereby defeating the purpose for which they were hired and trained.[94]

Other explanations for the failure of indigenous workers to prove as effective as patient educators as might have been expected are that they are not given sufficient training[95] or support by professional workers,[96] they are not perceived as sufficiently expert by patients,[89] or they have become socioeconomically distant as perceived by patients because of their new income, status, and agency identification.[48] Holder demonstrated with maternity patients in an urban hospital that *racial* similarity alone between communicator and patient was inadequate to influence subsequent behavior, but that other dimensions of similarity were important independent of race.[89] Simons et al question the similarity recommendation on grounds that "certain dissimilarities have positive effects on attitude change."[97]

Recommendation 12. The Department of Health, Education, and Welfare should support and encourage the use of indigenous health workers to *supplement rather than replace the communications from professionals.*

Communicator similarity has been found important as a determinant of influence on behavior relevant to health maintenance.[98-100] Mazen identified physical condition (pregnant vs. non-pregnant), race, shared experiences, and practical knowledge as key dimensions of similarity affecting behavioral influence and communicator effectiveness.[101] Similar results have been obtained in family planning.[102]

Grouping of Patients or Consumers

Similarity in physical condition or health problems of participants has been found an effective element in group discussion approaches to health

maintenance behavior among alcoholics, obese adults, neighbors meeting on accident prevention, presurgical patients in a general hospital, ambulatory hypertensive patients, parents of children with rheumatic fever, ulcer patients, adult cardiacs, parents in child health conferences, adult asthmatics, congestive heart patients, and, more frequently, diabetics.[103-105] The effectiveness of bringing together individuals who share common health problems appears to be based not only in the tendency to trust and conform to the judgment of others who have the same problem, but also in the quality of pertinent, relevant, and understandable discussion and mutual reinforcement that occurs among participants in such groups. If such groups of patients can also be organized with some socioeconomic homogeneity, the discussion of solutions to common problems is also made more relevant and credible. Self-help groups have followed this principle.[104]

Numerous studies have established the efficacy of group discussion as a powerful educational method to improve preventive health practices, increase visits to physicians, clinic, or mobile units for health screening or early diagnosis, and improve patient compliance with medical regimens.[105] Appropriate utilization of health services and facilities and return visits for medical care appear to be improved by group discussion as an educational strategy with ambulatory patients, such as hypertensives.[1,9-12,41,42,56,78-86,104]

Provider-Patient Communication

In 100 pre-1970 studies on compliance reviewed by Mitchell,[70] the only variables, apart from seriousness of the illness, that showed consistently positive associations with compliance were those indicating a good "doctor-patient relationship" and those indicating explicit attempts to provide patient education. Numerous, more recent compliance studies (not included in Marston's 1970[69] or Mitchell's review) support the need for improved relationships and communication between doctors and patient.[106-117]

Recommendation 13: The Department should *support the development and demonstration of teaching materials and continuing education programs to improve the communication and educational skills of health workers.*

Channels Other than Interpersonal

Communication channels are usually assessed on the basis of the types of adopters (e.g., early vs. late) or the stages of the adoption process (e.g., awareness, interest, trial, evaluation, adoption) with which they work best. In general, mass media are relatively more effective with early adopters and in creating awareness and interest, whereas more interpersonalized media and channels are more effective with late adopters and with behavioral change.

Until recently, the most widely quoted statement on "the role of mass media in public health" was Griffiths' and Knutson's (1960) article with that title. These authors built a persuasive case against the mass media as having anything but an information and support function, and that function primarily with people other than "those populations with which public health

.s primarily concerned" (p. 521). The main theme of their article was that mass media primarily reach opinion leaders and should "be employed in such a way that these opinion leaders are more effectively utilized in the communication networks they informally serve" (p. 522).[118]

This conclusion is quite consistent with current diffusion theory, but it must be called into question today not for its validity but for its limited view of modern media. When Griffiths and Knutson wrote their article, television was relatively unavailable to high-risk segments of the population. In fact, the latest of the three references cited by Griffiths and Knutson to document their claim of limited exposure to the media was dated 1950, when less than 10% of the U.S. homes had television. Swinehart noted that it was during the 1950s that "quality" magazines had their greatest circulation growth, and the percentage of homes with television had jumped from less than 10 to nearly 95% in 1963.[119]

It is still generally accepted in the diffusion literature as well as the marketing and health education literature that the effects of the mass media are limited primarily to the awareness stage of the adoption process and can be expected to achieve but minor shifts in behavior which is already motivated by other sources of influence.[7-12,33-38,57-61,120-123] It is also true that the urban poor continue to rely very much on interpersonal rather than mass channels of information.[124] Finally, it is still true that television is too expensive and inaccessible to most health agencies and institutions to do them much good beyond the information function.[125]

Competition for television time is not only formidable in economic terms, but the pervasiveness of erroneous and at times dangerous health information in the mass media is perhaps impossible to control without total censorship on advertisements as well as dramatic scripts. Manoff notes that nearly one billion dollars was spent on television by food advertisers in 1972, and nearly one third of all foods advertised can be classified as frivolous at best (candy, snacks, soft drinks).[126]

Nutrition education by other means continues to show increments in knowledge and sustained awareness of certain problems, but changes in behavior tend to be proportional to the intensity and continuity of the effort.[127-131] The majority of nutrition education efforts described in these and earlier articles are of brief duration and are still more didactic than experiential in their approach. The school lunch and Head Start mothers programs[132] and the outreach programs such as the Expanded Food and Nutrition Education Program (EFNEP)[47,133] appear to have greater potential than the one-shot "classes" or clinical approaches. In EFNEP, homemakers are visited monthly by nutrition aides who show them how to prepare new recipes. This kind of outreach program with home-centered health education and continuity has been found cost-effective in family planning as well, so long as the number, frequency, or duration of visits do not exceed their points of diminishing returns.[14,48,59-61,93,102]

At least a small residual of nonadopters and even of people who disavow

any awareness of innovations for which there have been saturation health programs will usually remain. In a study of employees of a company in Chicago, Stamler found that of the men examined annually for 10 years and told repeatedly that they were hypertensive, and referred to their private doctors, 6% still disavowed knowledge of their elevated blood pressure.[114] Thus, no matter how targeted the communication, relevant the message, and personalized the medium, there will be other constraints on knowledge, persuasion, and adoption that preclude a complete result in a given population. Health education requires more than communication.[1-14,56]

5. AT WHAT PROGRAM COSTS?

Previous reviews of the literature suggest the cost-benefit advantages of health education initially on the basis of cumulative evidence of relationships between specific health education strategies and improvement in specific indices of health or behavior.[2,12] By extrapolation from these more or less consistent relationships, cost-benefit estimates can be made on the trade-offs between investments in health education and alternative strategies related to specific diseases in terms of projected savings in primary health care, bed-days of inpatient care, work-days lost, long-term home or institutional care, and rehabilitation.

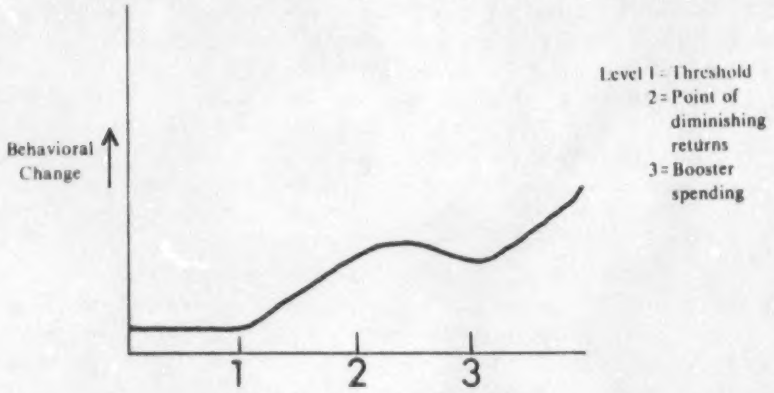
Where the trade-offs cannot be shown to be cost-effective for investments in health education, alternative policy considerations are suggested by the analysis, such as the necessity of more coercive preventive measures to achieve sudden changes in health behavior. Where, for example, the cumulative evidence does not indicate the probability of a sufficiently high success rate for health education directed at seat-belt usage to effect a reduction in emergency room visits, then alternative strategies, such as legislation directed at drivers, manufacturers, or highway engineers, are suggested.

Before recommending program areas and target populations in which health education should receive priority support, some final guidelines are suggested here on how to assess the optimum level of expenditure for specific programs or purposes.

The minimum that should be spent on health education for a specific purpose is the amount required to achieve that purpose. While this appears tautological, it is a tragic fact of much health education funding that the budget has been below the minimum required to obtain a desired effect. A threshold level of input is required before a difference in behavior will be perceptible.

Cost-benefit estimates suggest whether anything should be spent on a given educational program. If the ratio of potential benefits to costs is not greater than one, then nothing should be spent, strictly speaking. Cost-effectiveness ratios, while still in short supply, will enable policy-makers to compare the costs of two or more methods in achieving the same outcome. Then, depending on how much of that outcome is needed, the threshold level of spending might be directly obtained from the cost-effectiveness measure by

FIGURE 3
RELATIVE LEVELS OF EXPENDITURE ON
HEALTH EDUCATION AND THEIR THEORETICAL CONSEQUENCES



multiplication. The range within which decisions on variable amounts of spending should be made is the range between the threshold level and the point of diminishing returns, shown as levels 1 and 2 in Figure 3.

It is seldom the case that educational effects are permanent. Research on behavioral change, dropouts, discontinuance of health practices, learning curves, and memory curves predictably yields a pattern of forgetting and backsliding. Reinforcement is known to be as important to education as booster shots are to sustained immunization. Thus, after reaching the saturation level of spending, a period of time should elapse before introducing an additional expenditure on education for the same population. At the point when the behavioral changes achieved begin to deteriorate, booster spending on reinforcement or new educational methods may be necessary, shown as level 3 in Figure 3.

Recommendation 14. The Department should *review proposals for health education spending to determine whether they have given consideration to threshold, saturation, and booster levels of spending.*

Economy of Scale:
Methods Increasing Cost-Effectiveness

By aggregating, standardizing, and formalizing health education, economies of scale can be achieved at the expense of some effectiveness at the individual level. The cost per unit of production per patient educated, or per message disseminated can be reduced through aggregation. The goal in educational innovation is to design standardized materials, methods, and procedures that can be produced or implemented on a larger scale (therefore at lower unit prices) without sacrificing a proportionate amount of

effectiveness inherent in more individualized, personalized and flexible methods and procedures.[1]

The Timing of Investments

There are optimum times in the life history of a given health problem or program when spending for specific kinds of educational inputs will minimize risk and maximize payoff. As educational methods become more aggregated they tend to minimize risks while usually also minimizing payoff. More individualized methods increase the risks of loss because they are more expensive, but they also increase the possibility of benefits to the extent that they are usually more effective. The timing of investments in one educational method vs. another should follow the same decision rules governing priority setting in other areas of administration.

Recommendation 15. In a new program, the people most likely to respond first are those who are already motivated to adopt the recommended health practice. *During this early phase, low unit-cost measures such as written materials (pamphlets, etc.) are effective enough. As the program moves through the target population to increasingly "hard to reach" and high-risk groups, more expensive educational methods such as counseling sessions and home visits should be supported.*

The extra cost to reach one high-risk patient will be offset in most cost-benefit computations by the greater benefit accruing from behavioral change in a high-risk as contrasted with a low-risk patient. In economic terms, the marginal utility of behavioral change is greater in high-risk than in low-risk populations. This will be discussed in a final set of criteria: problem areas and target populations most likely to benefit from health education.

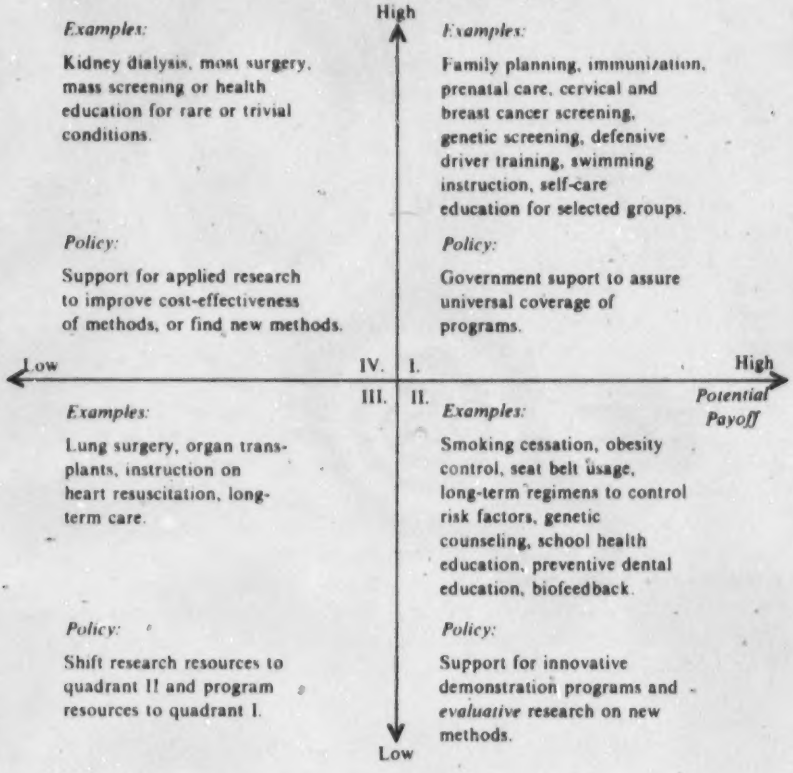
CRITERIA FOR POLICY RECOMMENDATIONS ON PROGRAM AREAS

Medical and health education strategies can be classified according to their known effectiveness, based on the foregoing review, and their potential payoff in cost-benefit terms. In this two-dimensional scheme, specific strategies can be placed in one of four policy categories, as shown in Figure 4. In quadrant I, where effectiveness is high and payoff is high, there is clear justification for major investments in programs to assure universal coverage. Examples include health education in relation to immunizations, family planning, cervical and breast cancer screening, and patient education in relation to acute conditions for which the therapeutic regimen is brief and relatively uncomplicated.

In quadrant II, where potential payoff is high but effectiveness is still low—as with seat belt usage, smoking cessation, and patient education with chronic conditions *where the regimens are long-term, complicated, painful, or otherwise troublesome*—the policy recommendation is for evaluative research on health education methods to improve effectiveness and behavioral research to understand the barriers and motives to change.

FIGURE 4

POLICY IMPLICATIONS FOR HEALTH STRATEGIES CLASSIFIED ACCORDING TO EFFECTIVENESS AND COST-BENEFIT POTENTIAL


EFFECTIVENESS
High
Low
Examples:
Kidney dialysis, most surgery, mass screening or health education for rare or trivial conditions.
Policy:
Support for applied research to improve cost-effectiveness of methods, or find new methods.
IV.
Examples:
Family planning, immunization, prenatal care, cervical and breast cancer screening, genetic screening, defensive driver training, swimming instruction, self-care education for selected groups.
Policy:
Government suport to assure universal coverage of programs.
I.
Low
High
Potential Payoff
III.
Examples:
Lung surgery, organ transplants, instruction on heart resuscitation, long-term care.
Policy:
Shift research resources to quadrant II and program resources to quadrant I.
II.
Examples:
Smoking cessation, obesity control, seat belt usage, long-term regimens to control risk factors, genetic counseling, school health education, preventive dental education, biofeedback.
Policy:
Support for innovative demonstration programs and evaluative research on new methods.
Low

Quandrant IV includes strategies for which effective means exist but payoff is low because the conditions are rare, the means are too expensive, or the problems are trivial. They include many surgical procedures, kidney dialysis, and mass screening or health education for diseases or conditions with very low incidence rates or very minor consequences. The policy recommendations for these problems is continued or increased investments in applied research to improve the cost-effectiveness of the methods.

The methods in quadrant III are those for which both effectiveness and potential payoff are low. They include procedures such as surgery for lung cancer and organ transplants and biofeedback where some spectacular successes have been recorded, but the overall cost-effectiveness and cost-benefit ratios are poor. The policy recommendation for these is to shift some of the public funds now being used in support of tertiary care facilities to programs in quadrant I and evaluative research in quadrant II.

Primary Prevention

The great potential payoffs are in preventing exposure and vulnerability to disease and injury agents. Primary prevention has had its successes and its disappointments, but it has seldom had investments proportional to its potential. Compared with the medical specialties, prevention has been—relative to other parts of the health care system—undervalued, unglamorous, and capable of helping save costs in other parts of the health care system if given the opportunity.

The inventory of primary prevention measures available to the public is well known, but most of these measures require behavioral changes and cooperation on the part of private citizens. Some of these can be legislated, but the majority depend on voluntary change, which depends heavily on adequate investments in health education.

Secondary Prevention

Earlier diagnosis and treatment of many diseases and the earlier identification of risk factors that can be controlled are the main hopes for containing the major causes of mortality and disability in this country. These include earlier diagnosis and treatment of neoplasms, alcoholism, streptococcal infections, tuberculosis, asthma, irregularities in the functioning of selected organs (heart, hearing defects, amblyopia, kidney), and other conditions for which there are medical or surgical technologies to spare the victims at least some of the suffering they would otherwise experience with later treatment. In addition, there are conditions not necessarily regarded as diseases themselves, the early identification of which can lead to treatment plans or reorganization of life styles or environment that will reduce the otherwise high probability for these people that they would experience a particular kind of health problem. These include the coronary-risk factors of cigarette smoking, hypercholesteremia, and hypertension; the accident-risk factors of alcoholism, epilepsy, and visual defects; the genetic-risk factors of sickle-cell trait or Tay-Sachs; the lung-risk factors of smoking, industrial or housing exposures to coal dust, asbestos, mite dust, pollens, exhausts or radiation; the allergenic sensitivity to specific substances, and so forth.

The strategies for achieving secondary prevention in this regard, apart from the therapeutic procedures themselves, are *multiphasic screening; periodic medical and dental examinations; mass screening for specific conditions* (including genetic screening); *public education regarding early recognition of symptoms* (including breast self-examination, cancer "danger signs," indicators of a "drinking problem," and early onset signs of acute attacks—heart, asthma, use of a fever thermometer) and the importance of *seeking medical care early for diagnosis* of these symptoms; patient education following diagnosis and prescription to improve *compliance with therapeutic regimens; genetic counseling;* and continuing reinforcement education for the adoption of risk-reduction behavior.

This is not intended as a complete inventory, but rather as a broad classification of strategies. Furthermore, the order in which these strategies are listed does not imply priority. The temporal precedence of screening over patient education for compliance does not necessarily mean that H.E.W. should first emphasize screening and then shift its efforts to patient education. In fact, there is some justification for concern with the wisdom of the National High Blood Pressure Education Program's extensive screening activities, for example, which have the potential of flooding the clinics with hypertensives before the current record of 50% compliance among those under treatment can be improved upon through patient education research and evaluation. Indeed, the reduction of the 50% of those not currently under treatment would likely increase the percentage of treated but not under control, because they are probably less motivated than those now under treatment.

The issue for policy consideration is whether any or all of these strategies are worthy of shifting medical resources from their current downstream emphasis where they have at least a known effectiveness. The main advocates for the shift upstream have been public health and preventive medicine who have argued more from logic than from data that earlier diagnosis and treatment must make a difference in outcomes when organized on a large-scale basis. Unfortunately, the data do not consistently uphold the logic. But the data are strong enough to recommend health education efforts in relation to selective screening programs for selected (high-risk) groups.

The proliferation of specialized screening programs runs the risk of leading into all of the same problems that specialization and fragmentation of treatment has had. The arguments for comprehensive primary care should apply equally to screening whenever possible. Health education could then be based in screening centers with a single, rather than multiple, recruitment effort. Mobile units should concentrate particularly on industrial settings to reach blue-collar, high-risk groups least likely to seek periodic examinations.

Patient Education

One of the objections of health professionals to mass screening concerns the observation that large proportions of patients screened into treatment do not adhere to their therapeutic or risk-reduction regimens.

The research on patient compliance with medical regimens already reviewed strongly points to problems of doctor-patient and nurse-patient relationships and gaps in communication as major sources of noncompliance. Starting with failure to acknowledge and meet patient expectation on the first visit, through failure to communicate therapeutic information effectively and persuasively, failure to take family or work situation into account, and inability of the practitioner to predict or recognize the noncompliant patient, several points for educational intervention were identified by the research literature. Obviously, the education must include staff development and consultation on communication needs and skills. There are, of course, alternatives to face-to-face communication.[135,136]

Simonds has suggested as a policy goal for this decade that hospitals "should take a major role in the provision of services for health promotion and health maintenance, including the provision of health education to all who use the hospital or are within its geographical area."[137] Economic justifications for such roles for hospitals currently apply primarily to those serving prepaid plans and tax-based hospitals rather than to proprietary hospitals. New provisions for reimbursement of health education services under Medicare, Blue Cross, and potentially, National Health Insurance, make health education economically feasible even for hospitals that have depended on keeping patients horizontal.

Reports previously submitted or recently published reviewed the cost-benefit status of patient education and concluded that the potential benefits are much greater than the costs of supporting health education in medical care settings.[2,10,12] Apart from the direct administrative benefits to the health care system and the direct benefits for the patient, health education also offers indirect benefits by improving the outcomes of medical and surgical procedures. Major emphasis should be given to the development of professional and material resources for patient education programs in anticipation of national health insurance legislation. The following four recommendations are endorsed from those of the National Conference on Preventive Medicine of the Fogarty International Center and the American College of Preventive Medicine.[118]

Recommendation 16. The Department should *"require, as a condition of federal, state, and local funding, that all hospitals, health maintenance organizations, neighborhood health centers, and other community health facilities—both public and private—provide...in regulations to be promulgated by the Secretary of DHEW, consumer health education as an integral part of their service responsibilities to their individual users and to their service constituencies.*

Recommendation 17. The Department should "*...encourage all third-party payors—public and private—to reimburse providers for the net costs of patient education.*"

The following additional recommendations of the National Conference on Preventive Medicine are consistent with the foregoing analysis and findings:

Recommendation 18. The Department should *"encourage coordinated, comprehensive school health education programs through federal research and development funds and grants in aid to states."* The federal support should be directed to "evaluating school health education curricula, training teachers in health education, and encouraging state education agencies to take a more active role in promoting school health education."

Recommendation 19. The Department should continue to *"provide federal support for research and development in consumer health education techniques, methodologies, and programs, and their evaluation."*

Setting Priorities

With the preceding analysis of the state-of-the-art and general recommendations as background, the remaining task is to focus health education on those target problems and populations that will yield the greatest improvements in the nation's health. For each health problem (whether defined in terms of death, disease, or disability), the priority relative to other health problems varies for different populations.

Hence, the first general recommendation to be offered is the *endorsement of a method for assigning different priorities to the same health problems in different populations*, in lieu of a general priority ranking for the nation. Following the recommendation of this technique for allocation decisions within population groups, a series of recommendations for high priority populations will be offered on the basis of anticipated health education coverage in National Health Insurance.

An Index for Assigning Program Priorities Within Populations

The two technical problems facing the policy analyst in deciding which problems to tackle first in a given population are: (1) How should the various available measures of the problems (deaths, bed-days, outpatient days) be weighted? (2) How much improvement is possible in each problem, regardless of its extensity relative to other problems? The administrator obviously must take other (non-technical) considerations into account, but these two at least would provide the basis for a scientific recommendation. The first is a question of relative *need* for improvement. The second is a question of relative *potential* for improvement. The "need" question corresponds roughly to the "potential payoff" of "benefit" dimension of Figure 4 discussed in the previous section. The "potential for improvement" question corresponds to the "effectiveness" dimension of Figure 4.

A method has been developed for the Indian Health Service[19] to combine both of these dimensions in a single index (Q) which uses national averages (age- and sex-adjusted) as the standard of "potential improvement" for a given population. Thus,

$$Q = \frac{M_t}{M_s} DP + \frac{274A + 91.3B}{N}$$

where

M_t = age- and sex-adjusted mortality rate for the target population for a given cause of death,

M_s = age- and sex-adjusted mortality rate for the reference population, i.e., total U.S. population,

D = crude mortality rate (per 100,000 population) for the target population,

P = years of life lost because of premature death for the target population,

A = hospital days for the target population,

B = outpatient visits for the target population,

274 and 91.3 = constants used to convert A and B to years per 100,000 population; 3 outpatient visits are equated in time to one day.

The Q index takes into account the major considerations that go into both professional judgment and community values about the relative urgency of different health problems. If a community has an excess of deaths, hospital days, or outpatient visits for a given disease or condition relative to the national average after adjusting for age and sex distributions, that community will have a higher Q rating for that disease or condition. This allows the national averages to serve as a benchmark for the state-of-the-art, including medical and health technology, health care facilities, self-care, and life styles. The application of this index should therefore lead to the focusing of health education resources on those problems for which selected populations have suffered disproportionately.

Table 1 illustrates how the Q index resolves major discrepancies in the ranking of health problems by hospital days, outpatient visits, and mortality.

Recommended Priorities for Health Education Goals

The following recommendations for target populations and behavioral goals to be achieved through health education are based on assessments[140] of the most productive areas in which payment under National Health Insurance (NHI) might be made:

Recommendation 20. Payments for health education services should be made under national health insurance as part of (a) maternity care, (b) preventive child care, (c) adult preventive care, and (d) chronic illness care, in that order of priority.

Recommendation 21. Community health education efforts should seek to increase prenatal visits to an average of one per month through the 28th week of pregnancy, two per month from 28 to 36 weeks of pregnancy and one per week after the 36th week of pregnancy.

Recommendation 22. During pregnancy, instruction should be offered on nutrition, family planning, self-care, delivery, and parenthood: up to six hours of group instruction each, for mother and father.

Recommendation 23. During intrapartum care, through the fifth postpartum day, hospitals should provide reimbursable bedside instruction to mothers up to six hours total on self-care, infant care, and family planning.

Recommendation 24. At least one post-partum home visit by a public health nurse or other qualified health provider within the first two weeks after discharge from the hospital should be provided in order to assist with implementation of home care and to provide additional education for parenthood.

Recommendation 25. Community health education should encourage and NHI should provide for one office or clinical visit each for the mother and infant to their respective physicians during the first eight weeks after birth for routine examination, advisement, laboratory procedures, and follow-up family planning service.

Recommendation 26. Community health education for preventive child

TABLE 1

CLASSES OF DISEASE RANKED BY TRADITIONAL HEALTH DATA AND BY THE Q INDEX (IN THE INDIAN AND ALASKAN NATIVE POPULATION)[1,10]

Classes of Disease[1]	Rank Order			
	Inpatients	Outpatients	Deaths	Q
Infective and parasitic diseases	1	2	9	2
Neoplasms	12	14	5	15
Endocrine, nutritional, and metabolic diseases	9	7	10	9
Diseases of the blood and blood-forming organs	17	15	14	17
Mental disorders	13	13	13	11
Diseases of the nervous system and sense organs	6	3	6	6
Diseases of the circulatory system	8	9	2	12
Diseases of the respiratory system	2	1	3	3
Diseases of the digestive system	4	5	4	4
Diseases of the genito-urinary system	7	10	11	10
Complications of pregnancy, childbirth, and the puerperium	5	8	15	7
Diseases of the skin and subcutaneous tissue	11	6	16	13
Diseases of the musculoskeletal system and connective tissue	10	11	17	14
Congenital anomalies	14	16	12	16
Certain causes of perinatal morbidity and mortality	16	17	8	8
Symptoms and ill-defined conditions	15	12	7	5
Accidents, poisonings, and violence	3	4	1	1

[1] *International Classification of Diseases, 8th revision. Adapted for use in the United States. PHS Publication No. 1693. U.S. Government Printing Office, Washington, D.C., 1968.*

care should encourage, and NHI should support, seven visits during the first year of life, three visits during the second year of life, and one visit each year between ages 2 and 5.

Recommendation 27. Health education in preventive child care settings should include counseling and anticipatory guidance regarding nutrition, accidents, hygiene, and child development according to standards to be established by the Secretary of HEW.

Recommendation 28. Community and school health education should encourage, and NHI should reimburse total costs of, no more than one visit per year to an office or clinic for purposes of maintaining immunizations, or

for physical development evaluations, and counseling regarding sexual development, alcoholism and drug abuse; and including five consultation visits when requests for those visits originate from a school health service for reasons of unsatisfactory progress in school.

Recommendation 29. Community and school health education should encourage, and NHI should support, (a) *routine dental services up to age 13 including oral examination, X-ray, prophylaxis, topical fluoride, counseling and education; and restorations;* and (b) developmental vision care and audiometry services up to age 18.

Recommendation 30. Community, college, and industrial health education programs should encourage, and NHI should support, adult preventive care including at least:

(a) 2 routine physicals between ages 18-30,
(b) 3 routine physicals between ages 31-40,
(c) 4 routine physicals between ages 41-50,
(d) 5 routine physicals between ages 51-60,
(e) annual physicals over age 60.

Recommendation 31. In addition to the above preventive services, all women in reproductive ages should be encouraged through health education to receive annual breast and pelvic examinations, a Papanicolaou smear and a G.C. culture; and should receive in the annual visit health education and family planning counseling.

Recommendation 32. Health and nutrition education should be provided by NHI as part of reimbursed home health services for both the patient and the family, as one means of reducing the length of stay and the probability of returning for further institutional care.

Recommendation 33. Patient education supported by NHI on both an individual and small group basis should be geared to meet the following objectives:

(a) development of appropriate self-management techniques and increased compliance with prescribed regimens;
(b) assist the patient or health consumer to utilize benefits appropriately;
(c) reduction of risks leading to health problems, minimization of the effects of an illness, and avoidance of recurrences; and
(d) orientation of the individual to seek early screening or treatment.

Recommendation 34. Within schools, health education and safety education (including driver education) should be carefully geared to the age-specific and sex-specific interests of students and should be taught only by teachers with specific preparation in the topics.

Recommendation 35. Within industry, alcohol and drug abuse education should be integrated with reimbursable, non-punitive programs of alcoholism counseling and rehabilitation.

Recommendation 36. Community health education and referral services should be designed to minimize the barriers to seeking care by individuals in need of crisis intervention for suicides, drug and other health problems having

social stigma or opprobrium associated with them.

These priorities, in approximately the foregoing order, should yield the maximum cost-benefit advantage to society and to consumers currently obtainable from health education.

The earlier recommendations for development, evaluation, and demonstration in less effective but high payoff areas such as smoking cessation, obesity control, diet therapy, genetic counseling, and long-term hypertension and diabetes management will lead hopefully to a further strengthening of health education as a central feature of health policy.

ACKNOWLEDGEMENTS

Connie Kansler assisted in several stages of this project. Sambasiva Reddy assisted with economic analyses. Sigrid Deeds, Ruth Faden, Pearl German, and Virginia Wang provided helpful suggestions. Mona Mitnick guided the entire effort with encouragement and critical reviews.

REFERENCES

1. Green LW: Evaluation and measurement: Some dilemmas for health education. Am J Public Health 67:155-161, February 1977.
2. Green LW: The potential of health education includes cost-effectiveness. Hospitals, JAHA 50:57-61, May 1, 1976.
3. Green LW: Methods available to evaluate the health education components of preventive health programs. In American College of Preventive Medicine: Preventive Medicine USA. New York, Prodist, 1977. Also in Somers AR: Health Promotion and Consumer Health Education. New York, Academic Publications, 1976.
4. Deeds S: A Guidebook for Family Planning Education. DHEW Publication no (HSA) 74-16002. Rockville, Md, Bureau of Community Health Services, 1973.
5. Kazdin AE: Behavior Modification in Applied Settings. Homewood, Ill, Dorsey Press, 1975.
6. Ubell E: Health behavior change: A political model. Prev Med 1:209-221, 1972.
7. Rogers EM: Communication of Innovations. New York, Free Press, 1971.
8. Rogers EM: Communication Strategies in Family Planning. New York, Free Press, 1973.
9. Mico PR, Ross HS: Health Education and Behavioral Science. Oakland, Third Party Associates, 1975.
10. Green LW: The application of diffusion theory to cardiovascular risk behavior in the public. In Enelow A, Henderson JB (eds): Applying Behavioral Sciences to Cardiovascular Risk. New York, American Heart Association, 1975.
11. Green LW: Should health education abandon attitude change strategies? Perspectives from recent research. Health Educ Monogr 1(30):25-48, 1970.
12. Green LW: Toward cost-benefit evaluations of health education: Some concepts, methods and examples. Health Educ Monogr 2 (suppl):34-64, 1974.
13. Andersen R: A Behavioral Model of Families' Use of Health Services. University of Chicago Center for Health Administration Studies, Research Series No. 25, 1968.
14. Becker MH (ed): The Health Belief Model and Personal Health Behavior. Health Educ Monogr 2:324-473, 1974.
15. Kerri JN: Anthropological studies of voluntary associations and voluntary action: A review. J Vol Action Res 3:10-25, 1974.
16. Marris P, Rein M: Dilemmas of Social Reform: Poverty and Community Action in the United States. Chicago, Aldine Publishing, 1973.
17. Grosser CF: New Direction in Community Organization: From Enabling to Advocacy. New York, Praeger Press, 1973.

18. Wang VL, et al: An approach to consumer-patient activation in health maintenance. Public Health Rep 90:449-454, 1975.
19. Warren RL: Community change: Some lessons from the recent past. Community Develop J 9:2-10, 1974.
20. Anthony WA: Human relations training and rehabilitation counseling: Further implications. Rehabil Coun Bull 17:171-175, 1974.
21. Canfield RE: The physician as a teacher of patients. J Med Educ 48(12, pt 2):79-87, 1973.
22. Carrera MA, Rosenberg G: Inservice education in human sexuality for social work practitioners. Clin Soc Work J 1:261-267, 1973.
23. Levine DM, Bonito AJ: Impact of clinical training on attitudes of medical students: Self-perpetuating barrier to change in the system? Br J Med Educ 8:13-16, 1974.
24. McKinlay JB: On the professional regulation of change. Sociol Rev Monogr No 20:61-84, 1973.
25. Weiss RL, Swearingen RV: Chairside Psychology in Patient Education: A Self-Instruction Course. US Department of Health, Education, and Welfare, National Institutes of Health. San Francisco, Dental Health Center, 1973.
26. Wolle JM: Multidisciplinary teams develop programming for patient education. Health Serv Rep 89:8-12, 1974.
27. Becker MH, Drachman RH, Kirscht JP: A new approach to explaining sick-role behavior in low income populations. Am J Public Health 64:205-216, 1974.
28. Finnerty FA Jr, Mattie EC, Finnerty FA III: Hypertension in the inner city: I. Analysis of clinic dropouts. Circulation 47:73-75, 1973.
29. Fletcher SW, Appel FA, Bourgeois MA: Management of hypertension: Effect of improving patient compliance for follow-up care. JAMA 233(3):242-244, June 21, 1975.
30. Shroeder SA: Lowering broken appointment rates at a medical clinic. Med Care 11:75-78, 1973.
31. Becker MH, Green LW: A family approach to compliance with medical regimens: A selective review of the literature. Int J Health Educ 18:2-11, 1975.
32. Mullen PF: Health education for heart patients in crisis. Health Serv Rep 88:669-675, 1973.
33. Green LW, Green PF: Intervening in social systems to make smoking education more effective. In Steinfeld J, et al (eds): Proceedings of the Third World Conference on Smoking and Health. Washington, US Government Printing Office, 1977.
34. Antonovsky A, Hartman H: Delay in the detection of cancer: A review of the literature. Health Educ Monogr 2:98-128, 1974.
35. Green LW, Roberts BJ: The research literature on why women delay in seeking medical care for breast symptoms. Health Educ Monogr 2:129-177, 1974.
36. Green LW: Site- and symptom-specific factors in secondary prevention of cancer. In Cullen J, Fox B, Isom R (eds): Cancer: The Behavioral Dimensions. New York, Raven Press, 1976.
37. Atwater JB: Adapting the venereal disease clinic to today's problem. Am J Public Health 64:433-437, May 1974.
38. Udry R, et al: Can mass media advertising increase contraceptive use? Fam Plann Perspect 4:37-44, July 1972.
39. Kalmer H: Member-Professional Agreement Related to Use of a Prepaid Adult Ambulatory Care Setting. Paper presented at the American Public Health Association, Chicago, November 1975.
40. Stimson GV: Obeying doctor's orders: A view from the other side. Soc Sci Med 8;97-104, February 1974.
41. Geertsen HR, Gray RM, Ward JR: Patient non-compliance within the context of seeking medical care for arthritis. J Chronic Dis 26:689-698, 1973.
42. Zola IK: Pathways to the doctor—from person to patient. Soc Sci Med 7:677-689, 1973.
43. Oakes TW, Ward JR, Gray RM, et al: Family expectations and arthritis. Patient compliance to a hand resting splint regimen. J Chronic Dis 22:757-764, 1970.
44. Porter AMW: Drug defaulting in general practice. Br Med J 1(5638):218-222, 1969.

45. Cauffman JG, Lloyd JS, Lyon ML, et al: Health information and referral services within Los Angeles County. Am J Public Health 63:872-877, 1973.
46. Littlefield JL: Nutritional labeling revisited. Regulatory considerations. Paper presented at Food Update XIII, Scottsdale, Arizona, 1974.
47. Wang VL, Ephross PH, Green LW: The point of diminishing returns in nutrition education through home visits by aides: An evaluation of EFNEP. Health Educ Monogr 3:70-88, 1975.
48. Green LW: Status Identity and Preventive Health Behavior. Pacific Health Education Reports No. 1. Berkeley, University of California, 1970.
49. Steele J, McBroom WH: Conceptual and empirical dimensions of health behavior. J Health Soc Behav 13:382-392, 1972.
50. Williams AF, Wechsler H: Interrelationship of preventive actions in health and other areas. Health Serv Rep 87:969-976, 1972.
51. Kasl SV, Cobb S: Health behavior, illness behavior and sick role behavior. Arch Environ Med 12:246-266; 531-541, 1966.
52. Kasl SV: The health belief model and behavior related to chronic illness. Health Educ Monogr 2:433-454, 1974.
53. Baric L: Recognition of the "at-risk" role: A means to influence health behavior. Int J Health Educ 12:24-34, 1969.
54. Hazell JW, Hodges FB, Cunningham GC: Intermediate benefit analysis—Spencer's dilemma and school health services. Am J Public Health 62:560-565, 1972.
55. Green LW, Figã-Talamanca I: Suggested designs for evaluation of patient education programs. Health Educ Monogr 2:54-71, 1974.
56. Green LW, Levine DM, Deeds S: Clinical trials of health education for hypertensive outpatients: Design and baseline data. Prev Med 4:417-425, 1975.
57. Burt R: Differential impact of social integration on participation in the diffusion of innovations. Soc Sci Res 2:1-20, 1973.
58. Feldman JJ: The Dissemination of Health Information: A Case Study in Adult Learning. Chicago, Aldine Publishing Co, 1966.
59. Green LW: Identifying and overcoming barriers to the diffusion of knowledge about family planning. Adv Fertil Control 5:21-29, 1970.
60. Lin N, Hingson R: Diffusion of family planning innovations: Theoretical and practical issues. Stud Fam Plann 5:189-194, 1974.
61. Vertinsky P, Vertinsky I, Zaltman G: Health information diffusion: An integrated model. Int J Health Educ 15(suppl), 1972.
62. National Clearinghouse for Smoking and Health: Adult Use of Tobacco, 1970. DHEW Publication no (HSM) 73-8727. Atlanta, US Department of Health, Education, and Welfare, Center for Disease Control, 1973.
63. Schwartz JL, Dubitzky M: Expressed willingness of smokers to try ten smoking withdrawal methods. Public Health Rep 82:855-861, 1967.
64. Stunkard AJ: The success of TOPS,'a self-help group. Postgrad Med 51:143-147, 1972.
65. Oja P, Teräslinna P, Partanen T, et al: Feasibility of an 18 months' physical training program for middle-aged men and its effect on physical fitness. Am J Public Health 64:459-464, 1974.
66. Harris L & Associates: The Public and High Blood Pressure: A Survey Conducted for the National Heart and Lung Institute. DHEW Publication no (NIH) 74-356. Bethesda, Md, National Institutes of Health, 1973.
67. Mackie M: Lay perception of heart disease in an Alberta community. Can J Public Health 64:444-454, 1973.
68. Davis MS: Variations in patients' compliance with doctor's advice: An empirical analysis of patterns of communication. Am J Public Health 58:274-288, 1968.
69. Marston M: Compliance with medical regimens: A review of the literature. Nurse Res 19:312-323, 1970.
70. Mitchell JH: Compliance with medical regimens: An annotated bibliography. Health

Educ Monogr 2(1):75-87, 1974.
71. Finnerty FA, Shaw L, Himmelsbach C: Hypertension in the inner city, II: Detection and follow-up. Circulation 47:76-78, 1973.
72. Stokes J III, Payne G, Cooper T: Hypertension control—the challenge of patient education. N Engl J Med 289:1369, 1973.
73. Tagliacozzo DM, Ima K, Lashof JC: Influencing the chronically ill: The role of prescriptions in premature terminations of outpatient care. Med Care 11:21-29, 1973.
74. Lapham RJ, Mauldin PW: National family planning programs: Review and evaluation. Stud Fam Plann 3:29-52, 1972.
75. Mann RA: The behavior-therapeutic use of contingency contracting to control an adult behavior problem: Weight control. J Appl Behav Anal 5:99-109, 1972.
76. Kilbom A, Hartley LH, Saltin B, et al: Physical training in sedentary middle-aged and older men. I. Medical evaluation. Scand J Clin Lab Invest 24:315-322, 1969.
77. Harris WE, Bowerman W, Fadden RBM, et al: Jogging: An adult exercise program. JAMA 201:133-135, 1967.
78. Dwyer JT, Feldman JJ, Mayer J: The social psychology of dieting. J Health Soc Behav 11:269-287, 1970.
79. Abramson EE: A review of behavioral approaches to weight control. Behav Res Ther 11:547-555, 1973.
80. Hall SM, Hall RG: Outcome and methodological considerations in behavioral treatment of obesity. Behav Ther 5:352-364, May 1974.
81. Cornacchia A: A layman's view of group therapy in weight control. Can J Public Health 58:505-507, 1967.
82. Kornhaber A: Group treatment of obesity. GP 38:116-120, 1968.
83. Stunkard AJ, Levine H, Fox S: The management of obesity: Patient self-help and medical treatment. Arch Intern Med 125:1067-1072, 1970.
84. Wollersheim JP: Effectiveness of group therapy based upon learning principles in the treatment of overweight women. J Abnorm Psychol 76:462-474, 1970.
85. Levitz LS, Stunkard AJ: A therapeutic coalition for obesity: Behavior modification and patient self-help. Am J Psychiatr 131:423-427, 1974.
86. Jeffrey DB, Christensen ER, Pappas JP: A case study report of a behavioral modification weight reduction group: Treatment and follow-up. In Research and Development Report No. 33. Salt Lake City, University of Utah Counseling Center, 1972.
87. Berkanovic E, Reeder L: Ethnic, economic, and [illegible] factors in the source of medical care. Soc Prob 21:246-259, 1973.
88. Bossé R, Rose CL: Age and interpersonal factors in smoking cessation. J Health Soc Behav 14:381-387, 1973.
89. Holder L: Some theoretical and practical considerations in influencing health behavior. Health Educ Monogr 1(30):49-69, 1970.
90. Holder L: Effects of source, message, and audience characteristics on health behavior compliance. Health Serv Rep 87:343-350, 1972.
91. Golden A, Carlson D, Harris B: Non-physician family health teams for health maintenance organizations. Am J Public Health 63:732-736, 1973.
92. Jordan HA, Levitz LS: Behavior modification in a self-help group. J Am Diet Assoc 62:27-29, 1973.
93. Westheimer RK, et al: Use of paraprofessionals to motivate women to return for post-partum check-ups. Public Health Rep 85:625-635, 1970.
94. Grosser CF: Local residents as mediators between middle-class professional workers and lower-class clients. Soc Serv Rev 40:56-63, 1966.
95. Hoff W: The importance of training for effective performance. Public Health Rep 85:760-766, 1970.
96. D'Onofrio CN: Aides—pain or panacea. Public Health Rep 85:788-801, 1970.
97. Simons HW, et al: Similarity, credibility, and attitude change: A review and a theory. Psychol Bull 73:1-16, 1970.

98. Berscheid E: Opinion change and communicator-communicatee dissimilarity. J Pers Soc Psychol 4:670-681, 1966.
99. Janis IL, Hoffman D: Facilitating effects of daily contact between partners who make a decision to cut down on smoking. J Pers Soc Psychol 17:25-35, 1970.
100. Mendelsohn GA, Rankin NO: Client-counselor compatibility and the outcome of counseling. J Abnorm Psychol 74:157-163, 1969.
101. Mazen FR: Communicator Similarity and Acceptance of Recommendations: A Study of Attitudes and Behavior of Pregnant Women. Doctoral dissertation. New Haven, Yale University, 1967.
102. Fisher AA: The Characteristics of Family Planning Opinion Leaders and Their Influence on the Contraceptive Behavior of Others. Doctor of Science thesis. Baltimore, Johns Hopkins University School of Hygiene and Public Health, 1974.
103. Rosenberg SG: Patient education leads to better care for heart patients. HSMHA Health Rep 86:793-802, 1971.
104. Green LW, Werlin SH, Schauffler HH, et al: Research and demonstration issues in self-care: Measuring the decline of medicocentrism. Health Educ Monogr 5(2):161-184, 1977.
105. Young MAC: Review of research and studies related to health education communication: Methods and materials. Health Educ Monogr 1(25):63-70, 1967.
106. Aiken L, Aiken JL: A systematic approach to the evaluation of interpersonal relationships. Am J Nurs 73:863-867, 1973.
107. Alpert JJ: Slave patients and free physicians. N Engl J Med 284:667-668, 1971.
108. Anderson FP, Rowe DS, Dean VC, et al: An approach to the problem of noncompliance in a pediatric outpatient clinic. Am J Dis Child 122:142-143, 1971.
109. Bernstein L, Headlee R, Jackson B: Changes in acceptance of others resulting from a course in the physician-patient relationship. Br J Med Educ 4:65-66, 1970.
110. Blackwell B: Drug therapy—patient compliance. N Engl J Med 289:249-252, 1973.
111. Boyle CM: Differences between patients' and doctors' interpretation of some common medical terms. Br Med J 2:286-289, 1970.
112. Caldwell JR, Cobb S, Dowling MD, et al: The dropout problem in antihypertensive treatment: A pilot study of social and emotional factors influencing a patient's ability to follow antihypertensive treatment. J Chronic Dis 22:579-592, 1970.
113. Charney E: Patient-doctor communication. Pediatr Clin North Am 19:263-279, 1972.
114. Dodge JS: What patients should be told: Patients' and nurses' beliefs. Am J Nurs 72:1852-1854, 1972.
115. Heagarty MC, Robertson LS: Slave doctors and free doctors—a participant observer study of the physician-patient relation in a low-income comprehensive care program. N Engl J Med 284:636-641, 1971.
116. Hulka BS, Kupper LL, Cassell JC, et al: A method for measuring physician's awareness of patients' concerns. HSMHA Health Rep 86:741-751, 1971.
117. Inui TS, Yourtee EL, Williamson JW: Improved outcomes in hypertension after physician tutorials: A controlled trial. Ann Intern Med 84:646-651, 1976.
118. Griffiths W, Knutson AL: The role of mass media in public health. Am J Public Health 50:515-523, 1960.
119. Swinehart J: Voluntary exposure to health communications. Am J Public Health 58:1265-1275, 1968.
120. Hingson R: Obtaining optimal attendance at mass immunization programs. Health Serv Rep 89:53-64, 1974.
121. Lin N: Information flow, influence flow, and the decision-making process. Journalism Q 47:33-40, 61, 1971.
122. Lin N: The Study of Human Communication. Indianapolis, The Bobbs-Merrill Co, Inc, 1973.
123. Lin N, Burt RS: Roles of Differential Information Channels in the Process of Innovation Diffusion. Albany, International Center for Research State University of New York, Monograph No. 001, 1973.

124. Greenberg BS, Dervin B: Use of Mass Media by the Urban Poor. New York, Praeger Press, 1970.
125. Kalba K: Communicable medicine: Cable television and health services. Socio-Econ Plann Sci 7:611-632, 1973.
126. Manoff RK: Potential uses of mass media in nutrition programs. J Nutr Educ 5:12, 3-4, 1973.
127. Bauman HE: What does the consumer know about nutrition? JAMA 225:61-62, 1973.
128. Garner H, Mulcahy MJ: MIC project: Another kind of dietetics outreach program. Hospitals 47:96-97, 1973.
129. Goldberg JP: Some community nutrition services in a Boston program. J Am Diet Assoc 62:537-539, 1973.
130. Neumann AK, Neumann CG, Ifekwunigwe AE: Evaluation of small-scale nutrition programs. Am J Clin Nutr 26:445-452, 1973.
131. Nichaman M, Collins G: Nutrition programs in state health agencies. Nutr Rev 32:65-69, 1974.
132. Zimmerman RR, Munro N: Changing Head Start mother's food attitudes and practices. J Nutr Educ 4:66-68, 1972.
133. Marketing Economics Division: Impact of the Expanded Food and Nutrition Education Program on Low-Income Families: An In-Depth Analysis. Washington DC, US Department of Agriculture, Economic Research Service, Report no 220, 1972.
134. Stamler J: High Blood Pressure in the U.S.—An Overview of the Problem and the Challenge. Proceedings of the National Conference on High Blood Pressure Education. DHEW Publication no (NIH) 73-486. Rockville, National Heart and Lung Institute, 1973.
135. Bartlett MH, Johnston A, Meyer TC: Dial access library—patient information service. N Engl J Med 288:994-998, 1973.
136. Skiff A: Experiences with methods for patient teaching from a Public Health Service hospital. Health Educ Monogr 2:48-53, 1974.
137. Simonds SK: Health education as social policy. Health Educ Monogr 2 (suppl):1-10, 1974.
138. Somers AR: Conference recommendations. The National Conference on Preventive Medicine: Summaries and Recommendations. In Preventive Medicine USA. New York, Prodist, 1977.
139. Miller JE: An indicator to aid management in assigning program priorities. Public Health Rep 85:725-730, 1970.
140. American Public Health Association: Proposed Preventive Benefits to be Covered on a First Dollar Basis Under National Health Insurance. Washington, DC, July 16, 1974, processed.